



गृह मंत्रालय
MINISTRY OF
HOME AFFAIRS



विद्यया अमृतं अश्नुते

Course on Scientific Techniques in Investigation of Shooting Cases (25-29 Aug, 2025)



विद्यया अमृतं अश्नुते

National Forensic Sciences University

Knowledge | Wisdom | Fulfilment

An Institution of National Importance
(Ministry of Home Affairs, Government of India)

About the Course

This course is tailored to enhance the scientific understanding and operational competence of judicial and law enforcement personnel involved in the investigation, prosecution, and adjudication of firearm-related crimes.

The course aims to bridge the gap between field-level incident response and forensic science applications, providing participants with hands-on exposure to modern techniques and technologies used in the scientific investigation of shooting incidents

Course Objectives

- To familiarize participants with forensic principles and modern scientific tools used in the investigation of shooting cases.
- To enhance the capability of investigating officers and judicial authorities in understanding ballistic evidence, gunshot residues, and scene reconstruction.
- To impart practical knowledge on the collection, preservation, and interpretation of firearm evidence.
- To promote inter-agency coordination and standardization in firearm-related crime scene management and reporting.
- To enable informed decision-making and legal adjudication by understanding the scientific basis of evidence.

Course Content

The training course will cover both theoretical and practical aspects of shooting investigation, including but not limited to the following modules:

Module 1: Introduction to Forensic Ballistics

- History, scope, and branches
- Classification and components of firearms and ammunition

Module 2: Firearm Crime Scene Management

- Crime scene documentation and photography
- Evidence search, collection, packaging, and preservation techniques

Module 3: Internal, External, and Terminal Ballistics

- Firing mechanisms and projectile motion
- Ricochet, penetration, and wound ballistics

Module 4: Gunshot Residue (GSR) Analysis

- Mechanism of GSR formation
- Techniques for detection and analysis (SEM-EDX, chemical methods)
- Significance in determining firing distance and shooter identification

Module 5: Muzzle-to-Target Distance Estimation

- Experimental reconstruction and interpretation
- Pattern analysis and forensic implications

Module 6: Firearm and Cartridge Case Identification

- Tool mark examination
- Linking bullets and cartridge cases to a firearm
- Role of automated ballistic identification systems (e.g., IBIS)

Module 7: Legal and Judicial Aspects

- Admissibility of ballistic evidence
- Role of expert witnesses and report interpretation
- Case studies and court judgments

Module 8: Practical Demonstrations and Hands-on Sessions

- Live demonstration of firearm discharge
- Reconstruction of shooting incidents
- GSR collection and analysis
- Scene simulation exercises

Expected Outcomes

By the end of this course, participants will:

1. Gain a comprehensive understanding of scientific procedures in shooting case investigations
2. Be able to critically evaluate ballistic evidence and expert reports
3. Improve collaboration between forensic scientists, police, and judiciary
4. Enhance investigation quality, reduce ambiguity in reports, and strengthen court prosecution